

Claims

WHAT IS CLAIMED IS:

1. A method for fabricating a laminated composite body comprising metal foil and a plurality of fiber plies, said method comprising:
 - perforating a sheet of metal foil;
 - stacking the perforated metal foil sheet and the plurality of fiber plies in face to face relation in a predetermined order and orientation; and
 - infusing resin into the stacked sheet and plies so that resin flows through the perforations in the metal foil sheet and intersperses between the plurality of fiber plies to form the laminated composite body.
2. A method in accordance with Claim 1 further comprising curing the body after infusing resin into the stacked sheet and plies to bond the metal foil sheet and the plurality of plies together.
3. A method in accordance with Claim 1 wherein said step of perforating the metal foil sheet comprises directing a pulsed laser at the metal foil sheet.
4. A method in accordance with Claim 1 wherein said step of stacking the metal foil sheet and the plurality of plies comprises positioning the metal foil sheet between two plies of said plurality of plies.
5. A method in accordance with Claim 1 wherein the laminated composite body includes a plurality of metal foil sheets, said step of perforating the metal foil sheet further comprising perforating each sheet of said plurality of metal foil sheets, and said step of stacking the metal foil sheet and the plurality of plies comprises positioning the plurality of fiber plies between two sheets of said plurality of metal foil sheets.

6. A method in accordance with Claim 1 wherein the laminated composite body includes a plurality of metal foil sheets, said step of perforating the metal foil sheet being performed on only a portion of said plurality of metal foil sheets, and said step of stacking the metal foil sheet and the plurality of plies comprises positioning the plurality of fiber plies between a perforated metal foil sheet of said plurality of metal foil sheets and a non-perforated metal foil sheet of said plurality of metal foil sheets.

7. A method in accordance with Claim 1 wherein said step infusing resin into the stacked sheet and plies comprises infusing resin using a resin transfer molding process.

8. A method in accordance with Claim 7 wherein said resin transfer molding process further comprises infusing resin into the stacked sheet and plies using a vacuum assisted resin transfer molding process.

9. A method in accordance with Claim 1 wherein said step of infusing resin into the stacked sheet and plies comprises infusing resin using a seemann composites resin infusion molding process.

10. A method in accordance with Claim 1 wherein said step of infusing resin into the stacked sheet and plies comprises infusing resin using a controlled atmosphere pressure resin infusion process.

11. A laminated composite body comprising:
a perforated metal foil sheet having a plurality of openings extending through the sheet from a first face to a second face opposite said first face;
a fiber ply including a plurality of reinforcing fibers, said fiber ply being positioned adjacent said first face of the metal foil sheet; and
a resin extending through the openings in the metal foil sheet and between the plurality of reinforcing fibers of said fiber ply.

12. A laminated composite body in accordance with Claim 11 wherein the body comprises a plurality of fiber plies and the metal foil sheet is positioned between two plies of the plurality of fiber plies.

13. A laminated composite in accordance with Claim 11 wherein the body comprises a plurality of metal foil sheets and the plurality of fiber plies are positioned between two sheets of the plurality of metal foil sheets.

14. A laminated composite in accordance with Claim 11 wherein the body further comprises a non-perforated metal foil sheet and the plurality of fiber plies are positioned between the perforated metal foil sheet and the non-perforated metal foil sheet.

15. A laminated composite in accordance with Claim 11 wherein the metal foil sheet has a plurality of generally circular openings therein.

16. A laminated composite in accordance with Claim 15 wherein the generally circular openings each have a diameter between about 0.01 inches and about 0.04 inches.

17. A laminated composite in accordance with Claim 11 wherein the metal foil sheet has a plurality of generally square perforations therein.

18. A laminated composite in accordance with Claim 11 wherein the metal foil sheet has a plurality of generally diamond-shaped perforations therein.

19. A laminated composite in accordance with Claim 11 wherein the plurality of openings are generally evenly spaced apart on the metal foil sheet by between about 0.25 inches and about 2.0 inches.

20. A method for fabricating a laminated composite body comprising metal foil and a plurality of fiber plies, said method comprising:

arranging a plurality of metal foil strips into a layer having a plurality of gaps, each gap of said plurality of gaps being formed between adjacent strips of said plurality of strips;

stacking the layer of metal foil strips and the plurality of fiber plies in face to face relation in a predetermined order and orientation; and

infusing resin into the stacked sheet and plies so that resin flows through the gaps in the layer and intersperses between the plurality of fiber plies to form the laminated composite body.

21. A method in accordance with Claim 20 further comprising curing the body after infusing resin into the stacked sheet and plies to bond the layer of metal foil strips and the plurality of plies together.

22. A method in accordance with Claim 20 wherein said step of arranging the plurality of metal foil strips into a layer comprises arranging the metal foil strips side to side so the strips extend generally parallel to each other.

23. A method in accordance with Claim 20 wherein said step of stacking the layer of metal foil strips and the plurality of plies comprises positioning the layer of metal foil strips between two plies of said plurality of plies.

24. A method in accordance with Claim 20 wherein the laminated composite body includes a plurality of layers of metal foil strips, said step of stacking the layer of metal foil strips and the plurality of plies comprises positioning the plurality of fiber plies between two layers of said plurality of layers of metal foil strips.

25. A laminated composite body comprising:
a layer of metal foil strips having a plurality of gaps, each gap of said plurality of gaps spacing adjacent strips in the layer;

a fiber ply including a plurality of reinforcing fibers, said fiber ply being positioned adjacent the layer of metal foil strips; and

a resin extending through the gaps in the layer of metal foil strips and between the plurality of reinforcing fibers of said fiber ply.

26. A laminated composite body in accordance with Claim 25 wherein the body comprises a plurality of fiber plies and the layer of metal foil strips is positioned between two plies of the plurality of fiber plies.

27. A laminated composite in accordance with Claim 25 wherein the body comprises a plurality of layers of metal foil strips and the plurality of fiber plies are positioned between two layers of the plurality of layers.

28. A laminated composite in accordance with Claim 25 wherein the plurality of metal foil strips are arranged side by side so the strips extend generally parallel to each other.

29. A laminated composite in accordance with Claim 25 wherein each metal foil strip of the plurality of metal foil strips has a width of between about 0.125 inches and about 2.0 inches.

30. A laminated composite in accordance with Claim 25 wherein each metal foil strip is spaced from adjacent metal foil strips by a gap having a width of between about 0.01 inches and about 0.05 inches.